County Board

August 21, 2014
Handouts

1. Item X CUPHD on Restaurant Placards Program
2. Item XII A-1 Update on Satellite Jail Wall Panel Cracking-Action Deferred
3. Consent Agenda Item A-1-Additional Information Regarding Funding for Resolution 8984

Voluntary Posting of Inspection Notices
Champaign County

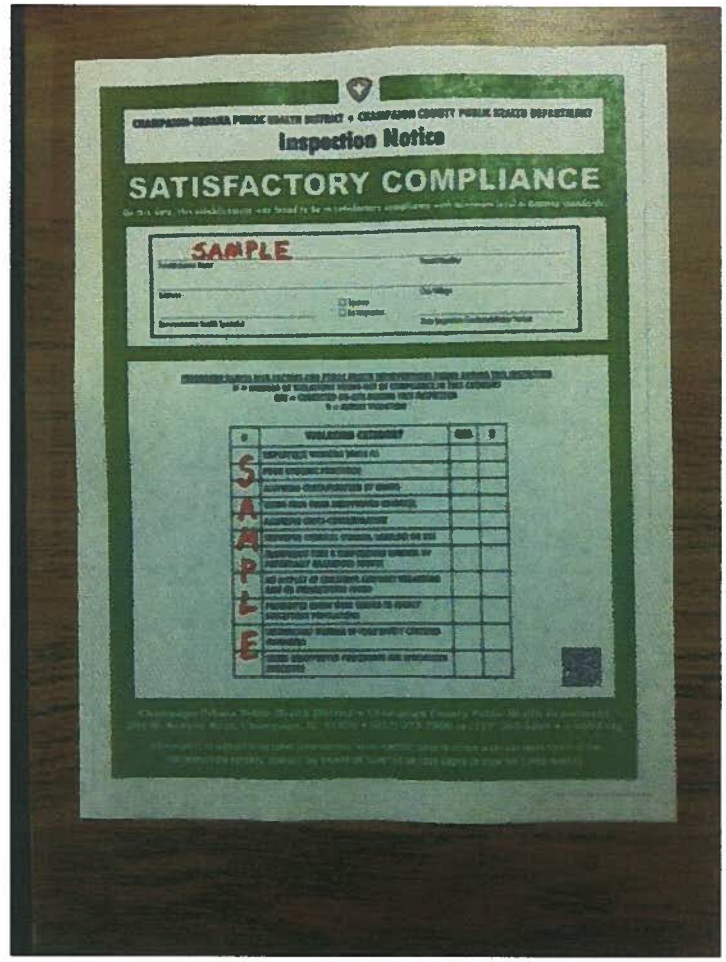
- 6-Month Summary

  January 1- June 30, 2014

- Champaign County Board Meeting, August 21, 2014

- Champaign County Public Health Department Board Meeting, August 19, 2014

- Presented at the Champaign-Urbana Public Health District Board Meeting, August 11, 2014



Champaign County Food Establishments

as of June 30, 2014

- 319 establishments
  - Category I: 81
  - Category II: 167
  - Category III: 71

- 181 routine 1st inspections

  - 11 Schwans truck inspections

  - 1 Status unknown (concession stand)

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  170 Total routine 1st inspections

170 Routine 1st Inspections

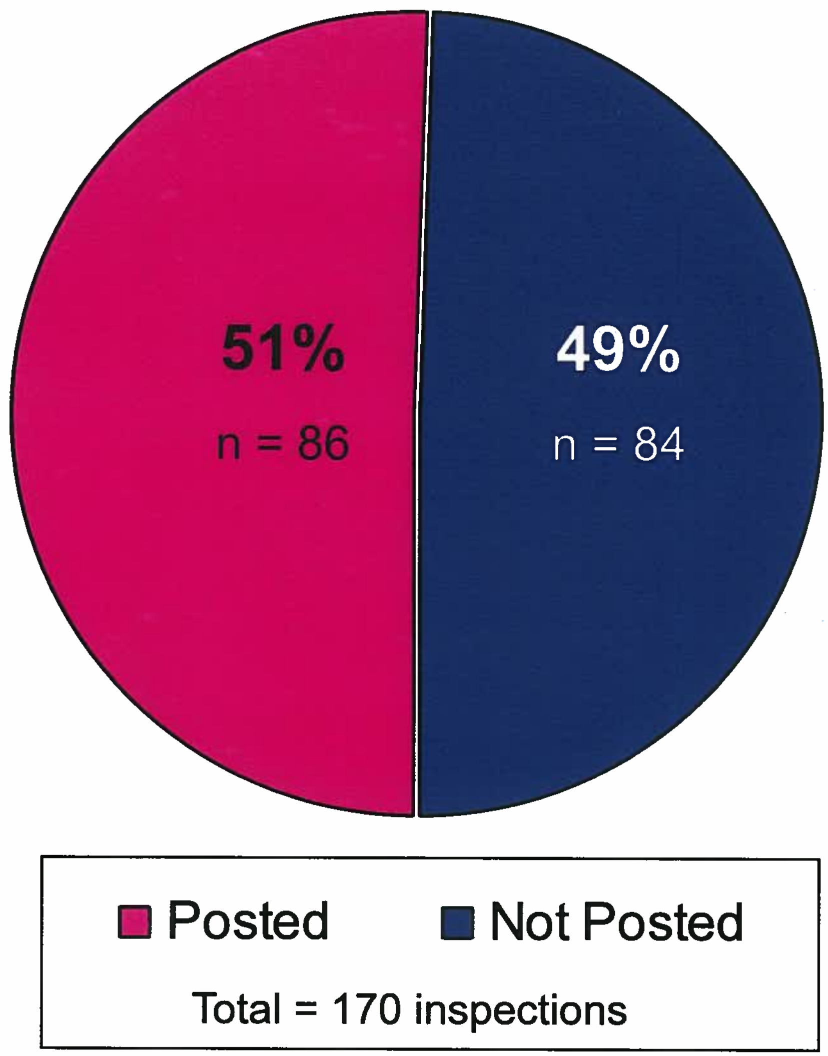
as of June 30, 2014

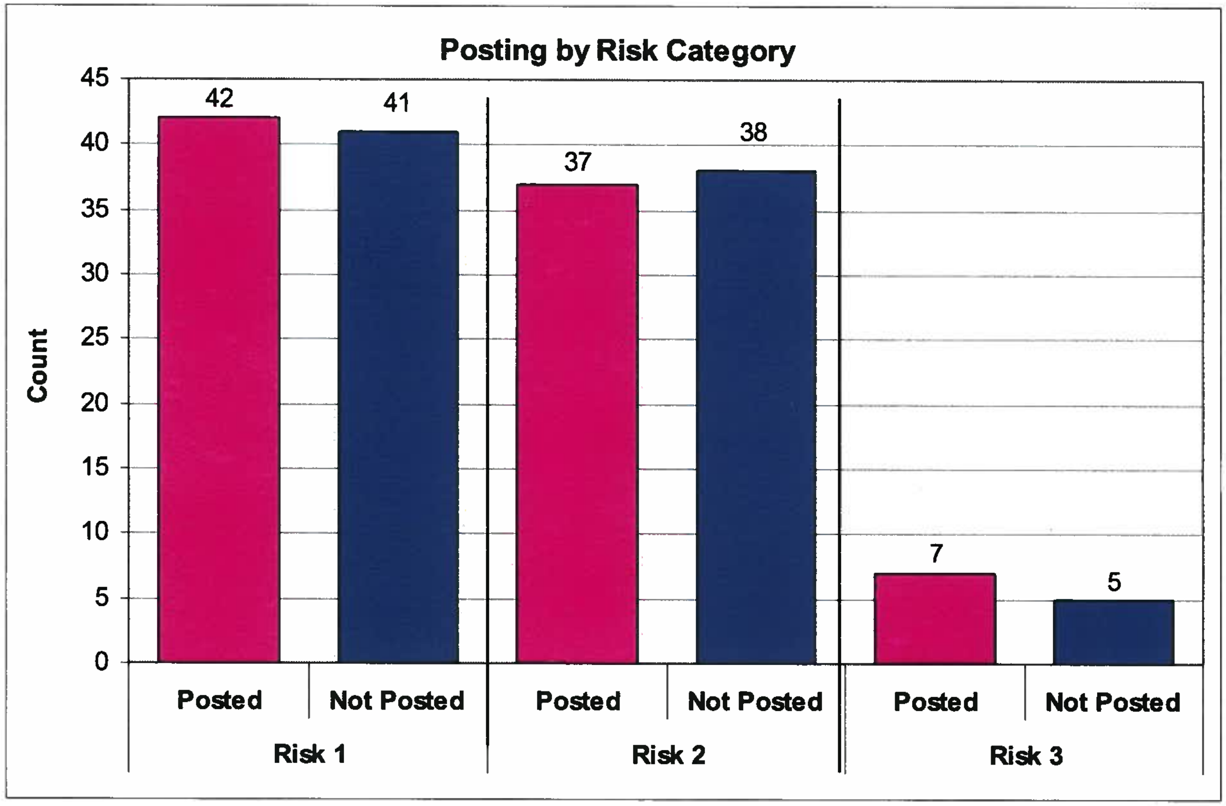
- By Risk Category
  - Category I: 83
  - Category II: 75
  - Category III: 12

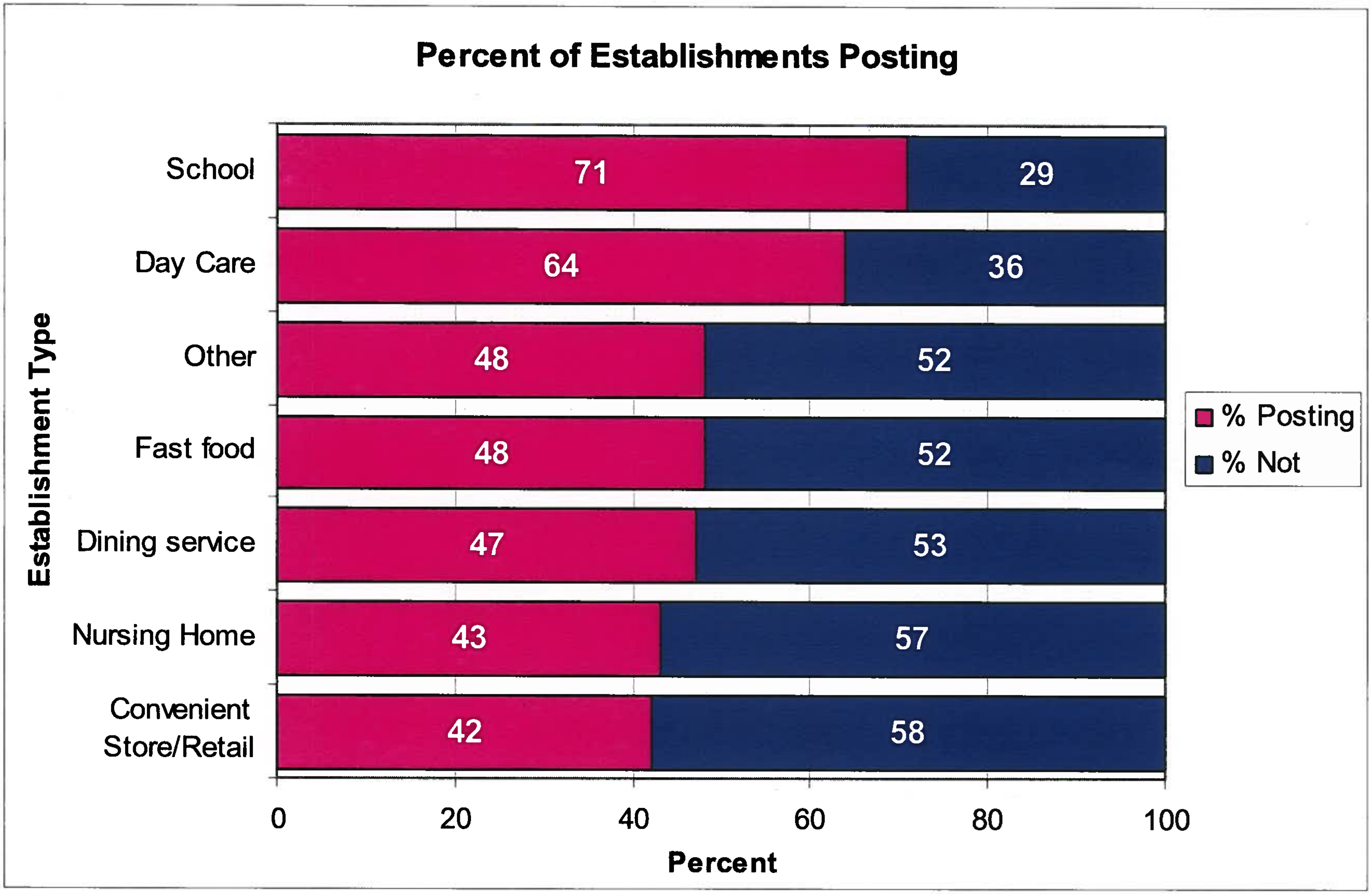
- By Establishment Type

Dining service restaurants	33
Fast food restaurants (including concession stands)	57
Schools (production and satellites)	19
Day cares	14
Nursing home (long-term care, Peace Meal satellites)	9
Retail food stores (convenient, full-service)	26
Other (taverns, commissary, caterer, lodging)	12

Posting and Not Posting Establishments




Posting by Risk Category
Count
45
40
35
30
25
20
15
10
5
0
42
41
37
38
7
5
Posted
Not Posted
Posted
Not Posted
Posted
Not Posted
Risk 1
Risk 2
Risk 3


Percent of Establishments Posting
Establishment Type
School
Day Care
Other
Fast food
Dining service
Nursing Home
Convenient Store/Retail
71
29
64
36
48
52
48
52
47
53
43
57
42
58
0
20
40
60
80
100
Percent
% Posting
% Not

Comparison on Performance between Posting vs. Not Posting

Performance measured as:

1) Total # of violations;
2) Total # of risk factor/intervention violations;
3) Total # of repeat violations; and
4) Inspection rating scores and adjusted scores.

Establishments that posted their Inspection Notices performed significantly better on ALL outcomes.

- Specifically, they had **fewer**:

1) Total # of violations;
2) Total # of risk factor/intervention violations; and
3) Total # of repeat violations.

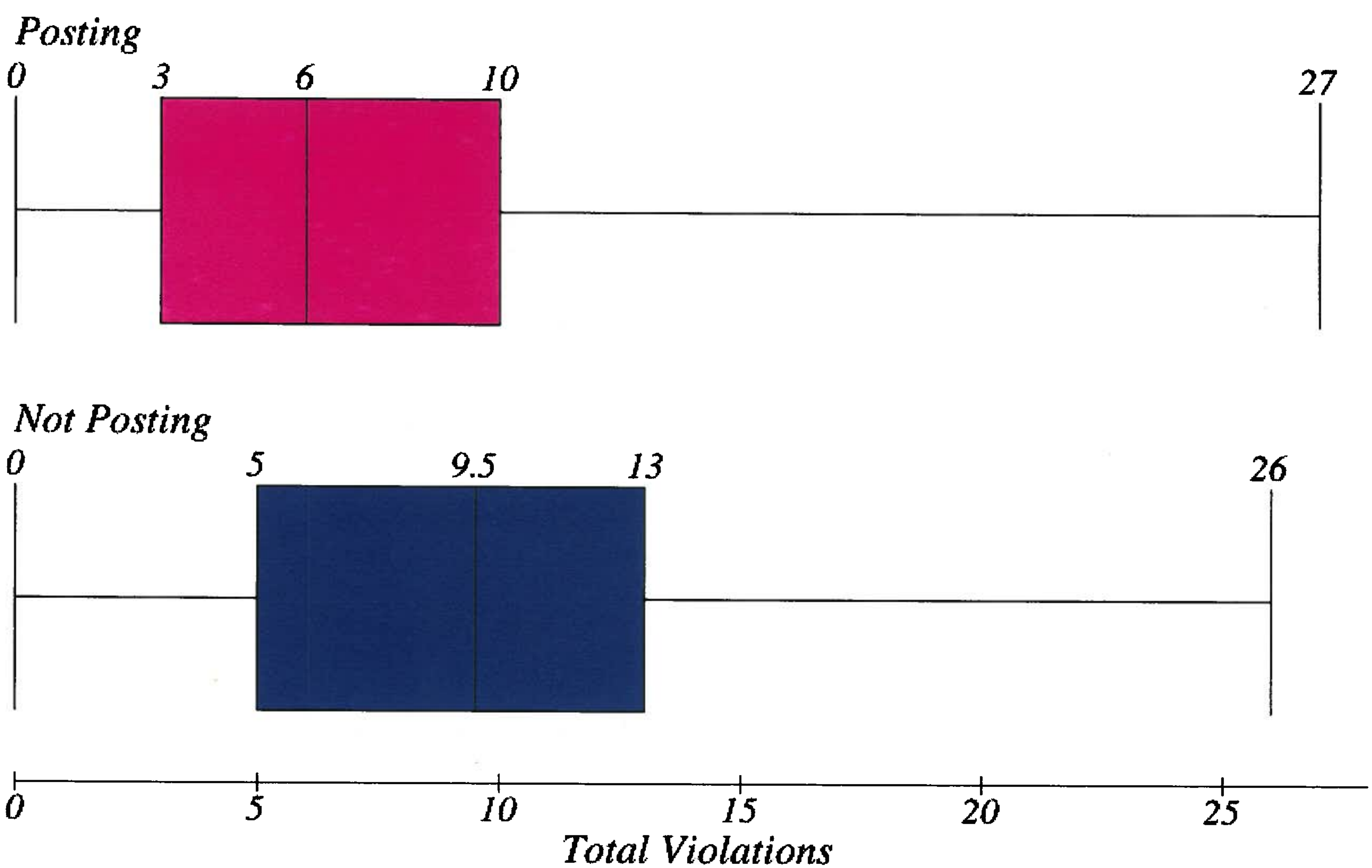
- They had **higher** inspection rating scores and adjusted scores.

- *All of these comparisons were statistically significant* $p<.01$ *level.*

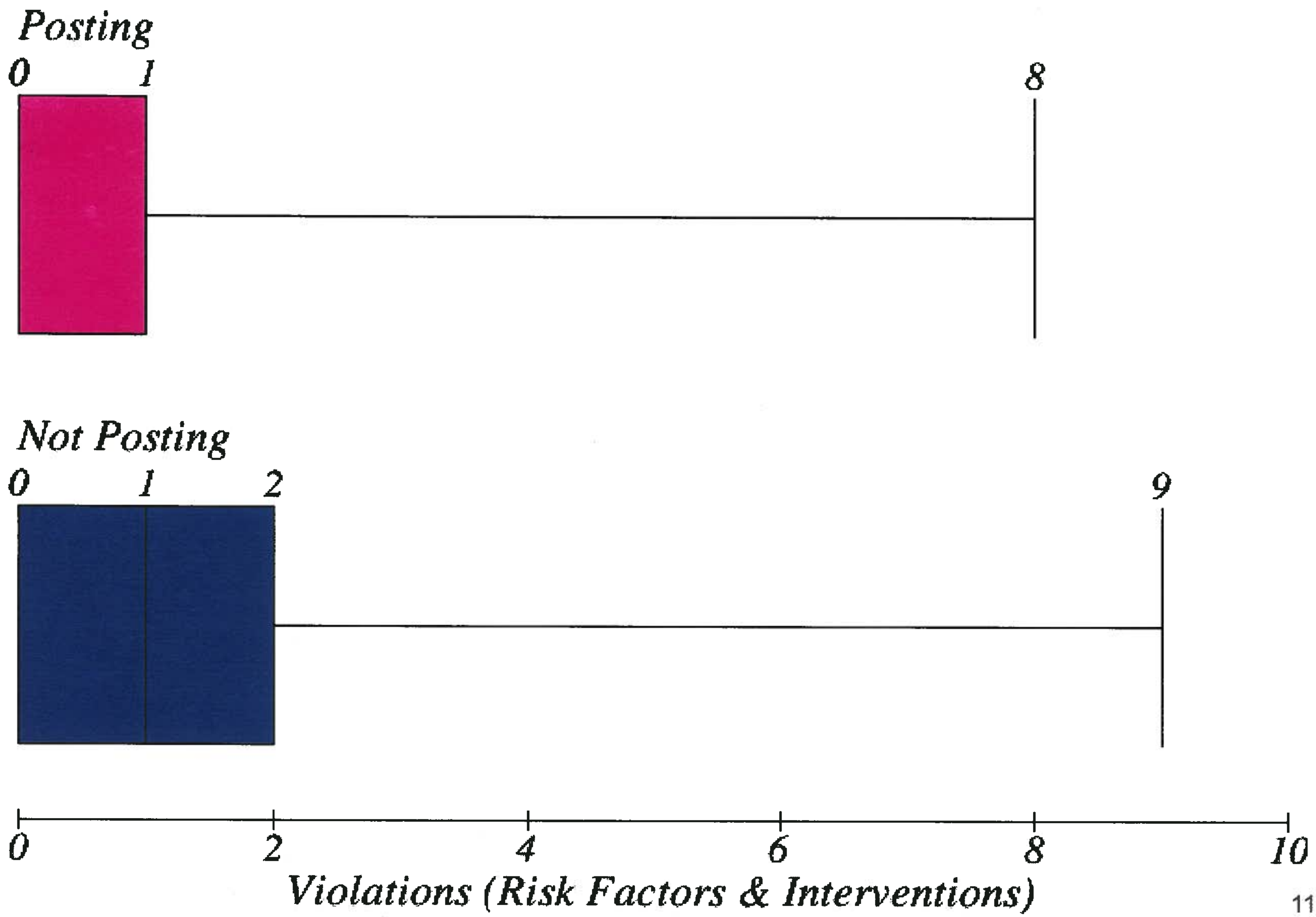
Comparison on Performance between County Establishments that Posted Inspection Notices vs. Those Who did not Post

		Total # of Violations		Total # of Risk Factor & Intervention Violations		Total # of Repeat Violations		Inspection Rating Score (FDA 1976)		Adjusted Score	
		Posted	Not Posted	Posted	Not Posted	Posted	Not Posted	Posted	Not Posted	Posted	Not Posted
Total Number of routine inspections		86	84	86	84	86	84	86	84	86	84
Mean		7.80	10.14	.72	1.49	2.14	3.30	90.41	86.04	82.52	72.00
Median		6.00	9.50	.00	1.00	2.00	3.00	93.00	87.50	88.00	74.00
Mode		2	7	0	0	0	1	95[a]	84	99	70
Std. Deviation		6.455	6.765	1.204	1.827	2.302	2.891	8.149	9.970	16.514	21.792
Variance		41.666	45.762	1.451	3.337	5.298	8.356	66.409	99.408	272.699	474.892
Skewness		1.138	.714	2.503	1.744	1.414	.974	-1.153	-.663	-1.469	-.964
Std. Error of Skewness		.260	.263	.260	.263	.260	.263	.260	.263	.260	.263
Kurtosis		.661	-.123	7.602	3.380	2.055	.654	.675	-.195	2.043	.714
Std. Error of Kurtosis		.514	.520	.514	.520	.514	.520	.514	.520	.514	.520
Minimum		0	0	0	0	0	0	66	60	26	5
Maximum		27	26	6	9	11	13	100	100	100	100
Percentiles	25	2.75	5.00	.00	.00	.00	1.00	85.75	80.25	76.00	61.25
	50	6.00	9.50	.00	1.00	2.00	3.00	93.00	87.50	88.00	74.00
	75	10.25	13.00	1.00	2.00	3.00	5.00	96.00	94.75	94.25	88.75
Mann-Whitney U Test (p)		P=.009		P=.001		P=.005		P=.003		P=.001	

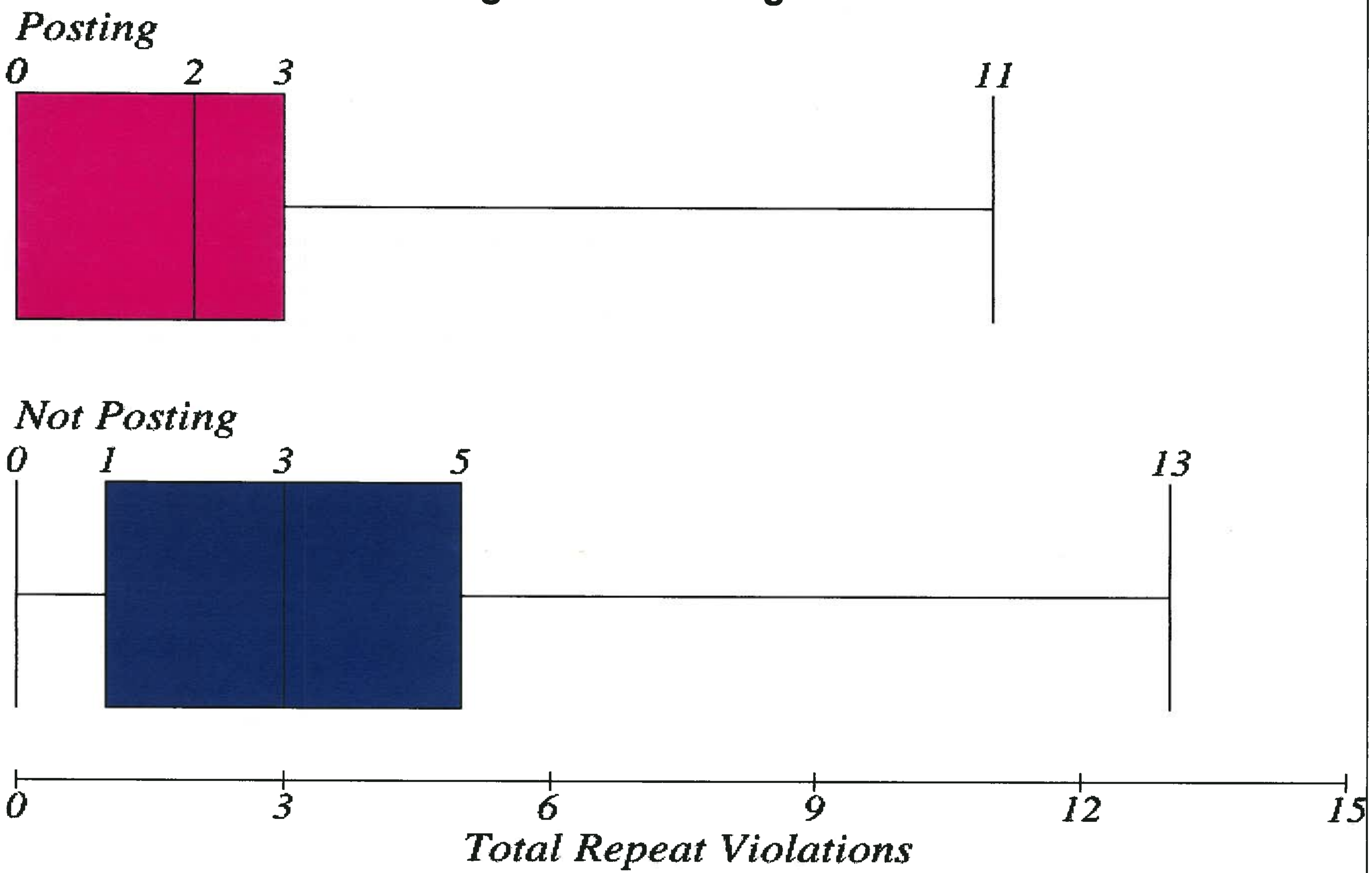
Performance as Total Number of Violations: Posting vs. Not Posting Establishments



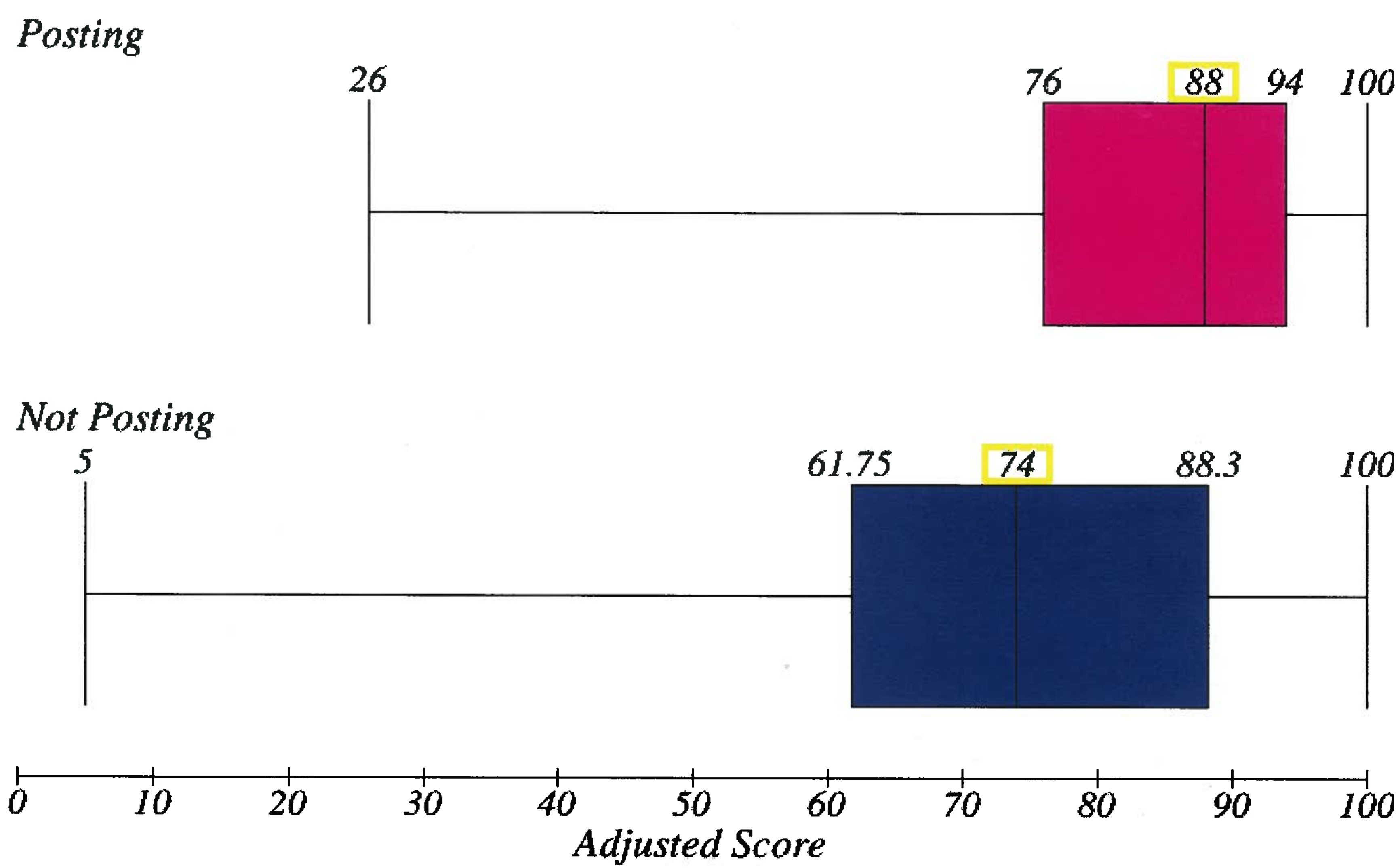
Performance as Total Number of Violations Categorized as Food-borne Illness Risk Factors and Public Health Interventions: Posting vs. Not Posting Establishments

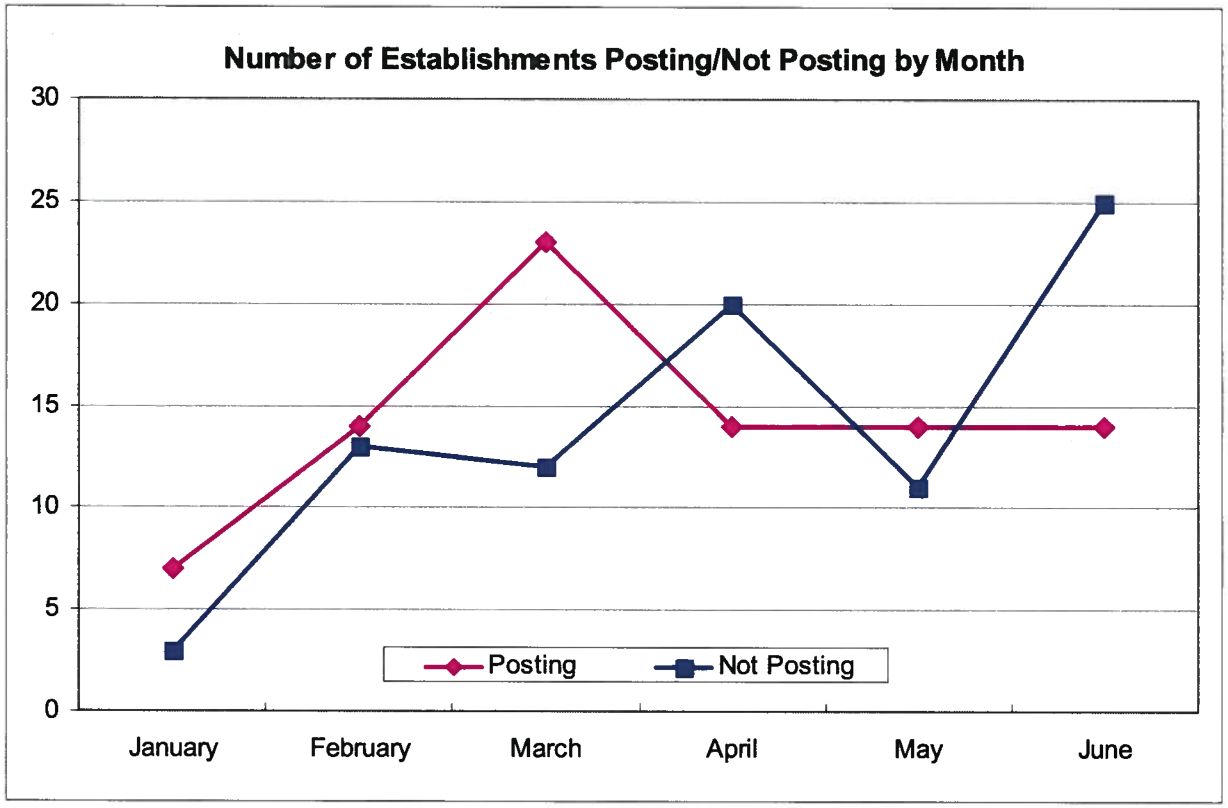


Performance as Total Number of Repeat Violations: Posting vs. Not Posting Establishments

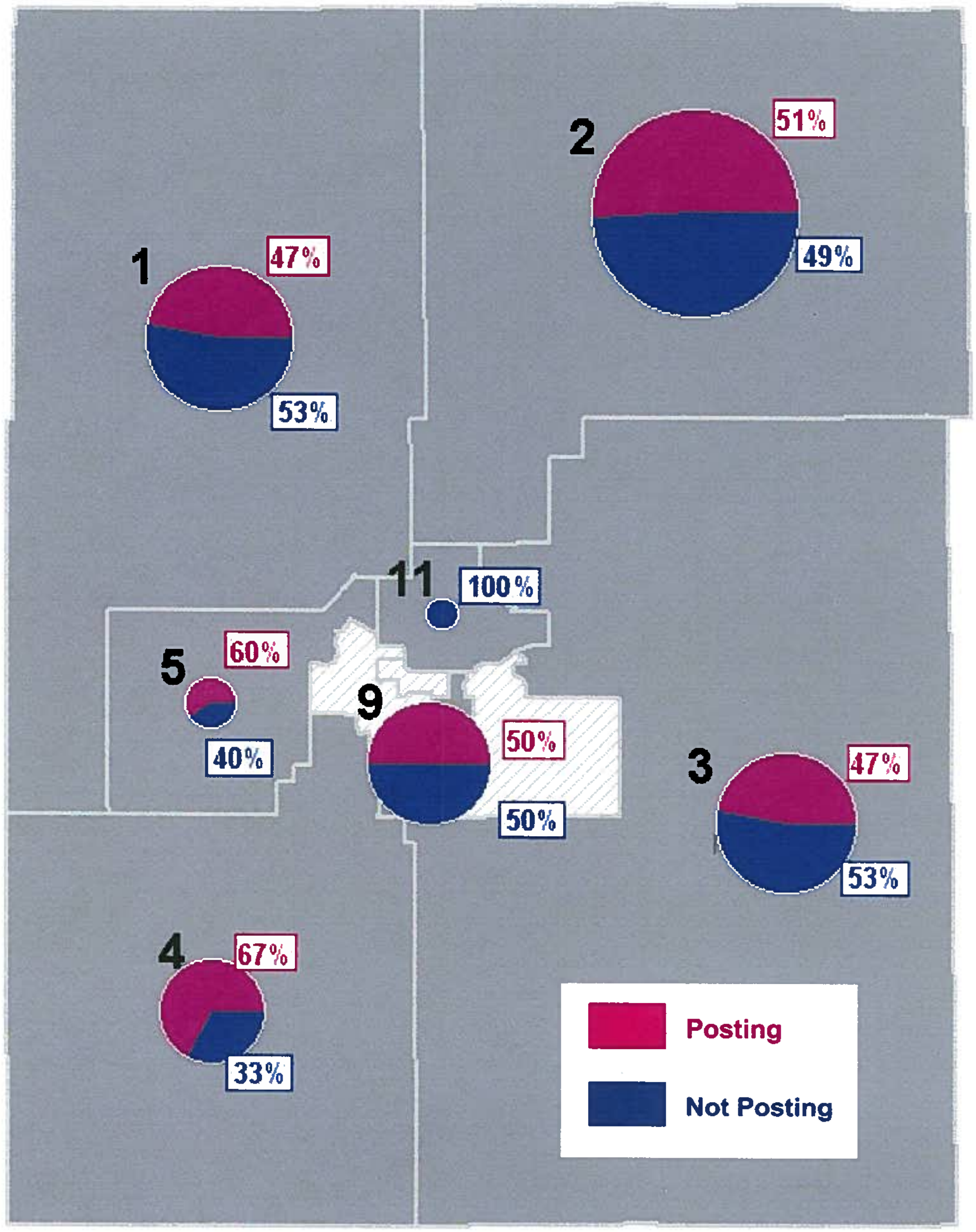


Performance as Adjusted Score: Posting vs. Not Posting Establishments




Number of Establishments Posting/Not Posting by Month
30
25
20
15
10
5
0
January
February
March
April
May
June
Posting
Not Posting

Posting by County Board Districts



DISTRICT	Number of Inspections
1	32
2	59
3	30
4	18
5	5
6	Required
7	Required
8	Required
9	24
10	Required
11	2

Acknowledgements

- Environmental Health Specialists
- Environmental Health Administrative Assistants
- Associates
  - Jonathan Green, ISU, EH intern
  - Stephanie Mundis, UIUC, Mosquito Surveillance and Abatement Biker
  - Xiaoling Xiang, UIUC, Social Work intern

CHAMPAIGN COUNTY ADMINISTRATIVE SERVICES
1776 East Washington Street, Urbana, Illinois 61802-4581
ADMINISTRATIVE, BUDGETING, PURCHASING, & HUMAN RESOURCE MANAGEMENT SERVICES
Debra Busey, County Administrator

To: Chair Alan Kurtz and the Members of the Champaign County Board

From: Van A. Anderson, Deputy County Administrator of Finance

Subject: Update: Satellite Jail Concrete Wall Panel Cracking Investigation

Date: August 21, 2014

As mentioned in my August 14, 2014, memo, the services of Wiss, Janney, Elstner Associates Inc.'s Howard Hill, PhD (Structural Engineering), PE (IN, WI), SE (IL, CA), were engaged to provide a second opinion on the Satellite Jail wall panel cracks. Dr. Hill's report was received yesterday afternoon. A copy for your review is attached.

Due to the differences in opinion expressed by Mr. Frauenhoffer and Dr. Hill, it is recommended that this issue be sent back to the County Facilities Committee for further evaluation.

Van A. Anderson

Attachment

WJE | ENGINEERS
ARCHITECTS
MATERIALS SCIENTISTS

Wiss, Janney, Elstner Associates, Inc.
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Northbrook, Illinois 60062
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www.wje.com

Via Email: dwalsh@co.champaign.il.us

August 20, 2014

Mr. Dan Walsh
Sheriff
Champaign County
204 E. Main Street
Urbana, IL 61801-2702

Re: Satellite Jail Exterior Wall Cracking
WJE No. 2014.4772

Dear Mr. Walsh:

At the request of Dana Brenner, Champaign County Facility Director, we conducted a brief evaluation of exterior wall cracking at the Champaign County Satellite Jail (Jail), located in Urbana, Illinois. The scope of this evaluation included a review of various construction documents and photographs provided by Mr. Brenner, and a roughly 2 hour site visit. This letter summarizes our findings and opinions.

BACKGROUND

The Jail was constructed in 1995. It is roughly rectangular in plan, with an overall north-south dimension of about 240 ft, and an overall east-west dimension of about 190 ft. The building is one-story in some locations, and includes up to three levels (one on grade and two mezzanines) in others. An aerial view of the facility is shown in Figure 1.

Our understanding of circumstances that led to WJE being called for assistance included the following:

- During a recent inspection of the facility, Mr. Brenner noticed many cracks in the exterior surfaces of the exterior walls
- The County asked a local structural engineer to visit the site and provide opinions concerning the cause and relevance of the cracking
- The County wanted to get another engineering opinion concerning the cracks before deciding what, if anything, should be done to address them

Mr. Brenner contacted Howard Hill of WJE last week to discuss the issue. After a brief phone conversation, it was decided that Mr. Brenner would send WJE available construction documents and representative photographs of the cracking for review, after which Mr. Hill would visit the site, visually examine cracked wall panels, and discuss his opinions with representatives of the County. The site visit occurred on August 19, 2014. Accompanying Mr. Hill during his visit were yourself, Mr. Brenner, and two Champaign County Sheriff Department officers. At the conclusion of the visit, you asked that WJE prepare a brief report summarizing our efforts and related opinions.

DOCUMENT REVIEW

A series of wall panel shop drawings provided by the County, dealing mainly with erection and typical details, provided considerable information regarding the construction and erection of the exterior concrete wall panels. The drawings were prepared by PDM Concrete, Inc. (PDM) of Rochelle, Illinois, presumably the manufacturer of the panels. Relevant information contained in these documents included the following:

- Most of the building's exterior walls consist of precast, prestressed concrete panels
- The panels are typically 11 inches thick, with a 6 inch thick interior wythe, a 2 inch thick layer of insulation board, and a 3 inch thick exterior wythe
- The insulation appears to be continuous across the width of each panel, but stops short of the top and bottom, creating solid, 11- inch thick sections at each end
- Inner and outer wythes are connected through the insulation with straight wire ties spaced at 24 inches centers, each way
- Typical interior wythes contain six, 0.5 inch diameter steel prestressing strands, while exterior wythes typically contain four identical strands
- Typical interior wythes contain two layers of 12x6 - W1.4xW2.5 welded wire mesh, while typical exterior wythes contain a single layer of identical mesh
- Exterior wall panels are typically 8 ft wide, and they vary in height depending on the height of the interior space they enclose
- Exterior wall panels bear on cast-in-place concrete strip foundations, and are attached to the foundations via steel angles that are welded to steel plates embedded in both elements. The wall panel plates are embedded on the inside face, and the foundation plates are located just inboard of the inside faces of the wall panels.
- Where structural elements of interior floors and roofs abutting the walls require vertical support, the wall panels are load-bearing. Where abutting floor and roof elements do not require vertical support, they are attached to the wall panels.
- Vertical joints between adjacent exterior wall panels typically include a roughly 0.5 inch gap that is filled with backer rod and sealant at both the interior and exterior faces
- The tops of most exterior wall panels are covered by the building's roofing system; typically a membrane and a metal coping. The east wall of the outside recreation area is an exception to this, as the tops of the panels are not covered.

A cross-section of a typical exterior wall panel is shown in Figure 2. Figure 3 shows the typical condition at the wall panel/foundation interface. A section through the top of the east wall of the outdoor recreation area is shown in Figure 4.

SITE VISIT OBSERVATIONS

On August 19, 2014, Howard Hill of WJE visited the site to visually examine representative exterior wall panels and surrounding construction. In addition to making visual observations, Mr. Hill used a metal detector to non-destructively look for evidence of embedded metal elements at a few exterior wall locations. The vast majority of the cracking observed by Mr. Hill had been thoroughly photographed by Mr. Brenner, and the digital photograph files were given to WJE. Therefore, most of the crack images included in this report were taken from Mr. Brenner's photographs.

Figures 5 and 6 show vertical cracks similar to what was observed at the same locations on several panels. These vertical cracks align with vertical prestressing strands in the outer wythes of the wall panels. Figures 7 and 8 illustrate this alignment. When selected cracks were scanned with a metal detector, aligned embedded reinforcement was indicated in each case. In some locations, efflorescence staining (whitish deposits) was observed along portions of the vertical cracks (Figures 6 and 7). Efflorescence results from the deposition of dissolved materials by water that evaporates after exiting the crack.

Figures 9 and 10 show cracks at the lower corners of panels. Such cracking occurred in many panels. At several vertical panel joint locations, corner cracks in each panel intersected the vertical edge of the associated panel at essentially the same location, a condition which is shown in Figure 10. Efflorescence staining was noted at some corner cracks. At two locations, the metal detector was oriented horizontally and passed over the upper, nearly horizontal, portions of each crack. In each case, the device indicated an embedded metallic element in line with the crack.

Figures 11 shows corner cracking, vertical cracking aligned with strands, and horizontal cracking. Efflorescence staining is visible along various portions of the lowest horizontal crack. Horizontal cracking similar to what is shown occurred at a few locations.

Horizontal cracking across the tops of panels, and apparent water staining, are shown in Figure 12. Mr. Brenner reported that there had been leaks in the roofing in the vicinity of these cracks. Similar cracking was noted in a few other panels (e.g., Figures 6 and 7).

Short, vertical cracks located on each side of a vertical joint were seen at many locations, an example of which is shown in Figure 13. The metal detector was used at a few such locations, and in each case, portions of one of the cracks appeared to align with a prestressing strand, while the other was located inboard (further from the joint) of the nearest strand.

Several exterior wall panels were visually examined from inside the building. In each case, the panel was free of noticeable cracking, even panels that had clear exterior cracks. The only panels that exhibited significant cracks in the thicker wythes were panels that formed the east wall of the exterior recreation area. Both faces of these panels are really exterior faces, and the tops of these panels were not covered with any form of membrane or coping. Figure 7 shows a portion of the top of one such panel. Also visible in Figure 7 is a portion of the steel framing supported by these panels. This framing supports a steel mesh and fabric net covering over the outdoor recreation area. As shown in Figure 4, this framing rests on a continuous steel angle that is connected to the panel with rows of steel studs.

Where stains appeared along a crack, some slight rust coloration was sometimes noted, but rust staining was neither universal nor severe.

The cracking described in this section of the report is not intended to comprise a comprehensive documentation of all panel cracking. It simply represents a description of the most common and readily visible forms of cracking that was noted during the visit.

In general, the sealant in the vertical panel joints appeared to be in poor condition. Extensive cracking was noted, and there were many breaches where the surrounding sealant material was brittle and crumbling. These conditions suggest the material was part of the original construction, and Mr. Brenner reported that he believed this to be the case. Mr. Brenner indicated that the roofing system was original as well. As noted above, Mr. Brenner also noted there had been roof leaks in the area adjacent to the panels shown in Figure 12.

CRACK CAUSATION

Vertical Cracks

There are a few mechanisms that could account for the vertical cracks shown in Figures 5 through 8, and similar cracking observed elsewhere. The one most common in our experience is corrosion of the underlying prestressing strands. When steel corrodes without restraint, the corrosion products occupy a much greater volume than the steel that was lost. When the creation of corrosion product is restrained, expansive forces are developed. Corrosion of reinforcing steel embedded in concrete can create enough expansive force to fracture the surrounding concrete, especially when the steel is near a concrete surface. Corrosion-related cracking, delamination (planar separations between sections of concrete) and spalling (dislodgement of sections of concrete separated from the surrounding material) of reinforced concrete elements are very common occurrences.

There are several potential sources of the moisture that would be needed to corrode the strands. The panel bottoms are embedded about two feet into soil that Mr. Brenner reported is frequently wet. Concrete in contact with water can draw the water into it for considerable distances, even against the force of gravity. Such "wicking" of water from the surrounding soils is a possible source of moisture, especially for the lower sections of strand. Rain water can reach outer wythe strands via cracks in the outer wythe concrete, of which there are many. Rain water can also penetrate the vertical surface of the outer wythe concrete. In the panels forming the east wall of the outdoor recreation area, water can reach the strands in both wythes through the cementitious material used to cover the strand ends at the panel tops.

In the subject panels, water filling small voids around strands could freeze, and exert expansive forces on the surrounding concrete. However, given the relatively small spaces available for water accumulation (assuming the concrete around the strands was well consolidated), there would not typically be enough water to cause damage. If concrete around strands was not well consolidated and water filled the associated voids, freezing could cause cracking of the type observed.

Slippage of prestressing strands can crack the surrounding concrete, and when it does, the cracks frequently align with the strands. Before the concrete in a panel is cast, the strands are put into position and stretched under large tension forces. According to the PDM drawings for this facility, each exterior wythe strand was stretched to achieve an in service tension of 23,000 lbs . After the concrete is placed and reaches a specified strength, the external devices holding the strands in tension are released, and the force in each strand is transferred to the panel, causing compressive stresses in the concrete. This production-induced stressing is the basis for the term "prestressed". When the strands are released, they want to shorten, but are restrained against shortening by their engagement with the surrounding concrete. This interaction between the steel and concrete typically results in shortening of the entire wall panel and shortening of the prestressing strand. If this engagement is not sufficient, the affected strand will slip and shorten even more. A small amount of slippage is expected, resulting in the strand ends being slightly recessed within the surrounding concrete. When a strand shortens, it expands and pushes outward against the surrounding concrete, with the force being proportional to the degree of shortening. As is the case with expansive corrosion and freezing water mechanisms, if the force is large enough, the confining concrete can crack. In prestressed wall panels, thinner sections crack more easily.

Corner Cracks

The corner cracking noted in the lower regions of many panels can also come from many sources. In some instances, a corner crack comprised an angled extension of a vertical strand crack. In most cases, the corner cracks were unrelated to strands, but appeared to coincide with other embedded steel elements, possibly steel mesh wires. If horizontal mesh wires terminated near the vertical panel edge surfaces, moisture getting past the sealant could reach the wire ends relatively easily. In our experience, mesh wires are not typically large enough to create damaging expansive forces when they corrode. However, the mesh used in these panels had relatively large wires (W2.5), and the cracks that were examined with the metal detector did appear to coincide with an embedded metallic element.

Given the several potential sources of wall panel moisture and the evidence of substantial moisture ingress and egress, freezing of trapped water may have been responsible for some of the cracking that is not aligned with strands. If water built up in the space between wythes, freezing could cause damage to the weaker outer wythe.

Horizontal Cracks

There are at least two plausible mechanisms for creating the horizontal cracking noted in the exterior wythes. The first is corrosion of embedded steel studs used to anchor structural elements to interior faces of the panels. If the steel studs attaching the steel elements used to connect to the abutting roof deck corroded enough to crack the concrete, and lift the upper portion of the panel relative to the lower portion, this could cause cracking through to the exterior surface. Roof leaks were reported adjacent to the cracked panels shown in Figure 12. Some of the horizontal cracks noted in the upper portions of the panels forming the east wall of the outdoor recreation area also appear consistent with this mechanism. There is a continuous steel angle along the tops of each panel in this area, and no roofing or other means of keeping rain water off the panel tops. There are also several areas of apparent water staining along these cracks.

Another mechanism that we believe could have contributed to horizontal cracking of outer wythes is restrained shrinkage. Most concrete, including that used to construct the subject panels, shrinks after it sets, primarily due to the consumption and loss of water as the concrete cures and dries. The inner wythe is twice as thick as the outer wythe. Having a much larger volume/surface area ratio, the inner wythe would dry more slowly, which means it would also shrink more slowly. Therefore, it would tend to restrain the more rapid shrinkage of the outer wythe via the connections at each end (i.e., the solid portions). Given sufficient restraint, horizontally oriented cracking could occur. If this mechanism was responsible for some of the cracking, that cracking would have likely occurred within a few years of the building's construction, as this is when most of the shrinkage would have happened.

Concrete that is prestressed (i.e., built so that embedded strand reinforcement maintains a state of compression in the surrounding concrete), tends to shorten in the direction of the prestressing strands due to a phenomenon called "creep." While creep shortening is in many ways similar to shrinkage-related shortening, creep in these panels would not tend to create cracking in the outer wythe concrete. This is due to the fact that the panels were designed so that both wythes would have nearly identical sustained compressive stresses. Therefore, the associated creep shortening in each wythe would tend to be similar, unlike the dissimilar degrees of shrinkage related shortening discussed previously.

Crack Causation Summary

Several possible sources of the observed cracking have been discussed. Others worth mentioning include handling distress (i.e., cracking caused by stresses imparted while the panels were moved from plant to final position) and damage due to impact after the panels were in place.

In order to be more definitive concerning the sources of observed cracking, considerable destructive examinations, materials testing and structural analyses would need to be done. We understand that expansion of the facility is a strong possibility in the near future. If exterior wall panels are to be removed as part of this expansion, this could afford an opportunity to further investigate the panel cracking in a very cost-effective manner.

OTHER PANEL DISTRESS ISSUES

When the void structure within concrete itself becomes wet enough, expansion of the water upon freezing can cause degradation. To mitigate this, concrete exposed to moist and freezing conditions is usually entrained with air in such a way that air voids accommodate the expansion before it damages the concrete. Given the fact that the exterior wall panel bottoms are buried in moist soils, the concrete used to construct the panels should have been air entrained. While we do not know if this was the case, we did not see any evidence of significant freezing-related damage (often called freeze-thaw damage) to portions of panels located immediately above grade.

During our site visit, someone asked about the possibility that corrosion of the panel/foundation connections contributed to the observed cracking. We do not believe that this is likely, primarily due to the fact that the concrete in which we saw cracking was effectively isolated from these connections. As noted above, the panel/foundation connections are located on the inside faces of the panels. While they are in areas where the panel is likely solid, we do not believe that cracking caused by corrosion of panel base embeds would propagate above grade in a manner consistent with our observations. Furthermore, we saw no significant cracking near the bottoms of the inside surfaces of the panels we examined.

During our site visit, we were asked if the County should be concerned about the integrity of the panel/foundation connections. We found no evidence to justify such concerns. First, even if these connections are frequently wet, we would not expect rapid degradation unless the surrounding fill was contaminated with corrosion-enhancing substances such as salts or acids. Second, even if a panel's connections were removed, the base of the panel would not be able to move laterally as it is confined by soil on one side and the building slab on the other. Loss of the base connections would limit a panel's ability to carry in-plane forces, such as shear caused by wind. However, given the number of panels available to carry such demands, and the height of the structure related to its plan dimensions, it would have considerable lateral strength and stiffness even with seriously deteriorated wall/foundation connections.

CRACKING SIGNIFICANCE

In our opinion, the cracking of the exterior wall panels that we observed has not had a serious impact on the structural integrity of the affected panels. The largely unaffected inner wythes provide most of the panels' capacity, and even given the presence of the observed cracking, the outer wythes remain capable of supporting considerable loads. We did not perform a structural evaluation of the wall panel design, which means we cannot provide any opinions regarding the abilities of the panels to carry applicable code-prescribed demands. However, we can say that, if the panels were properly designed, fabricated and constructed so as to be capable of sustaining applicable design demands, the observed cracking would not give us reason to believe they can no longer do so.

The primary problem associated with the observed cracking is a reduction in durability. If not addressed, the cracks will allow moisture to keep entering the panels, which will increase the degree and rate of panel degradation. Eventually, damage sufficient to cause structural concerns could develop and/or the abilities of affected panels to perform their intended functions (e.g., limit the passage of air, moisture and heat) could be noticeably impaired.

RECOMMENDATIONS

As we discussed during the site visit, it would be prudent to treat the observed cracking, repair known roof leaks, cover the tops of currently uncovered panels, and replace panel joint sealant so as to reduce the amount of moisture getting into the exterior walls.

Most of the observed cracks appeared narrow enough to be effectively sealed with an elastomeric wall coating. Depending on the type of coating selected, some cracks may need to be treated (e.g., routed and sealed, covered with a piece of membrane, pre-coated) before covering the entire panel.

As we discussed briefly on site, there are also many options available for sealing panel joints, covering wall panels and addressing roof leaks. If you would like assistance selecting or designing any or all of these repairs, please let us know.

Unfortunately, given the fact the exterior wall panels are buried in soil, there are few options - and no very efficient ones - to mitigate the wicking of moisture into the lower regions of the wall panels.

More definitive opinions regarding the factors contributing to the observed cracking would require further investigation, including some destructive work and materials testing. However, it is unlikely that having a clearer understanding of the cracking would significantly affect our opinions concerning how the cracking should be addressed. Consequently, additional study may not have substantial value to the County at this time. The proposed expansion of the facility may provide an opportunity to perform additional investigative work in a more cost-effective manner.

Summary

We visually examined most of the exterior surfaces of the exterior precast, prestressed wall panels at the Jail. In our opinion, the cracking we observed is due primarily to the effects of moisture that has entered the panels, and the cracking we observed has not had a significant impact on the structural integrity of the affected panels. However, the cracking is problematic in that it can promote additional deterioration which, if left unaddressed, could lead to structural and functional problems.

The cracks and other features of the facility can be modified so as to greatly reduce the amount of water entering the panels, which would have a commensurate impact on the rate of future panel degradation.

We appreciate the opportunity to assist the County in this matter. If you have any questions, or if we can provide additional assistance, please contact us any time.

Sincerely,

WISS, JANNEY, ELSTNER ASSOCIATES, INC.

Howard J Hill

Howard J. Hill, PhD, S.E.
Principal
Illinois Licensed Structural Engineer; No. 4819

Figure 1- Aerial view of Jail; north is up (from Bing Maps)

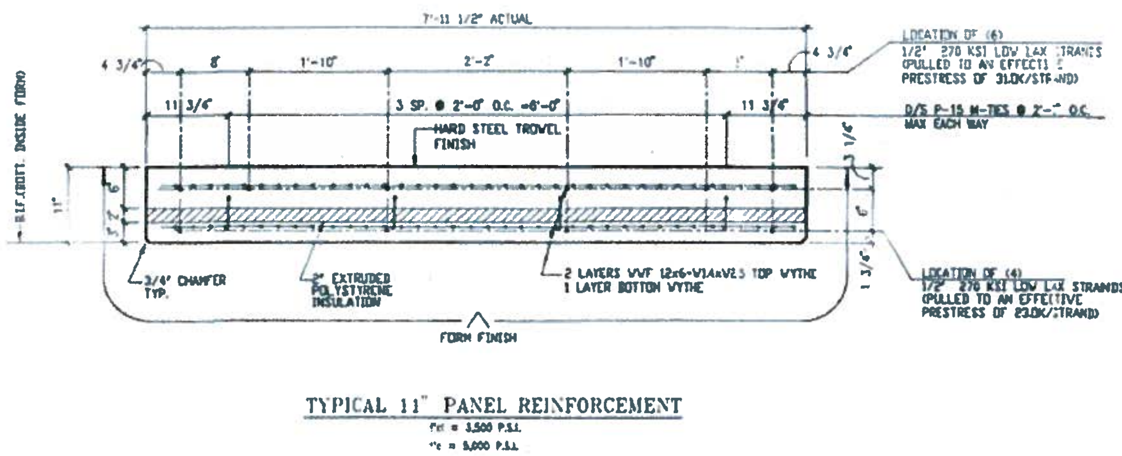

Figure 2 - Typical exterior wall section (PDM Shop Drawing E12)

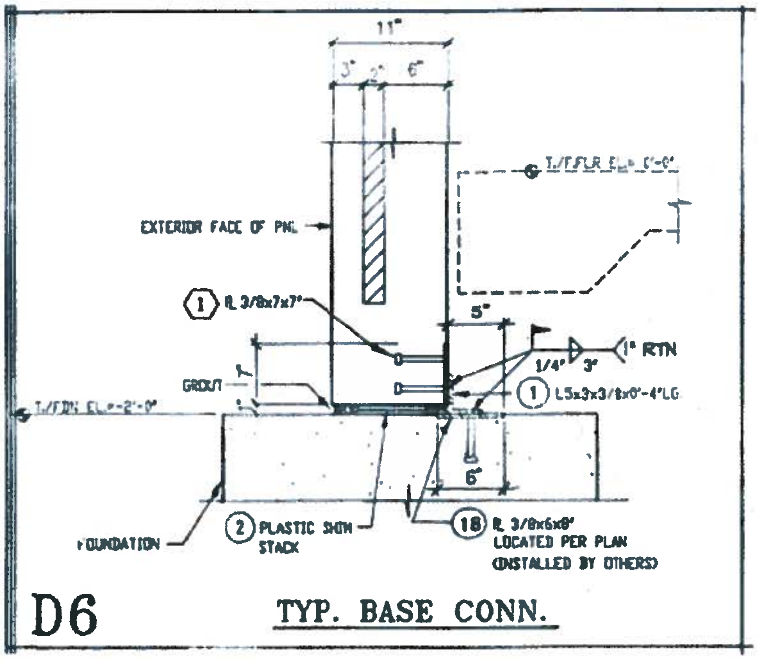

Figure 3 - Typical exterior wall/foundation interface (PDM Shop Drawing E10)

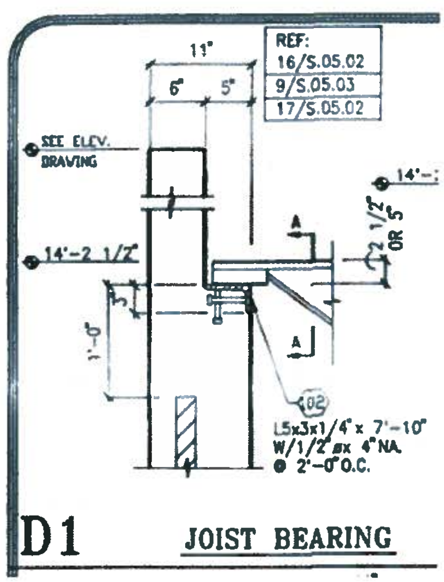

Figure 4 - Top of east wall of outdoor recreation area (PDM Shop Drawing E10)

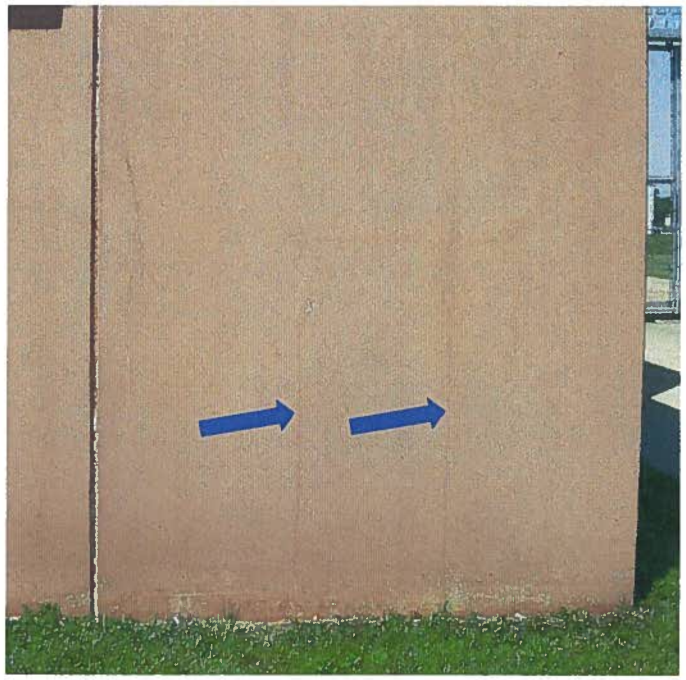

Figure 5 - Vertical cracks aligned with prestressing strands (arrows; Brenner photo)

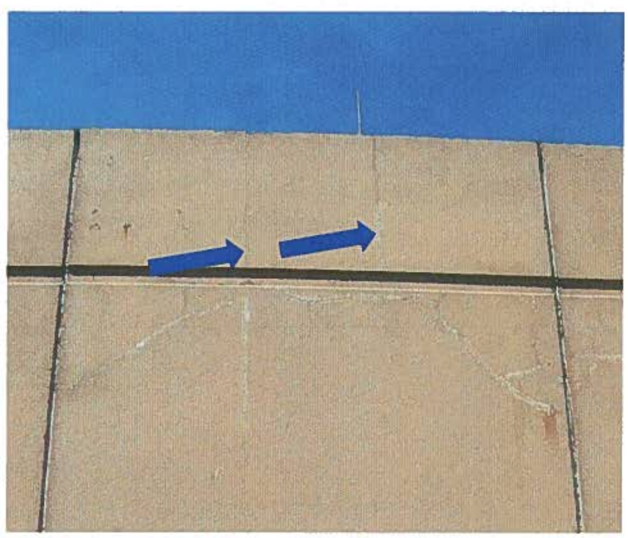

Figure 6 - Vertical cracks aligned with prestressing strands (arrows; Brenner photo)

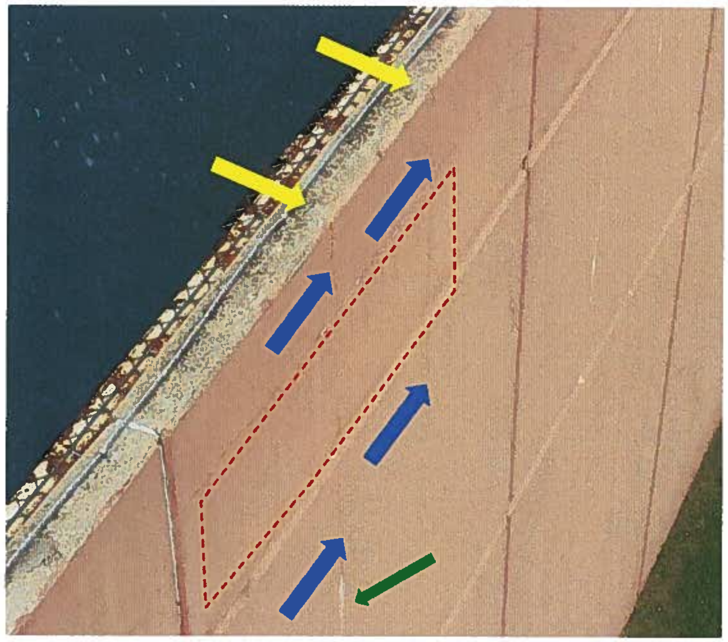

Figure 7 - Vertical cracks aligned with prestressing strands (blue arrows). Strand ends at top of panel covered with cementitious material (yellow arrows); and efflorescence staining indicating substantial water flow from lower end of one crack (green arrow). Darker staining is visible below much of the horizontal crack (within red outline)

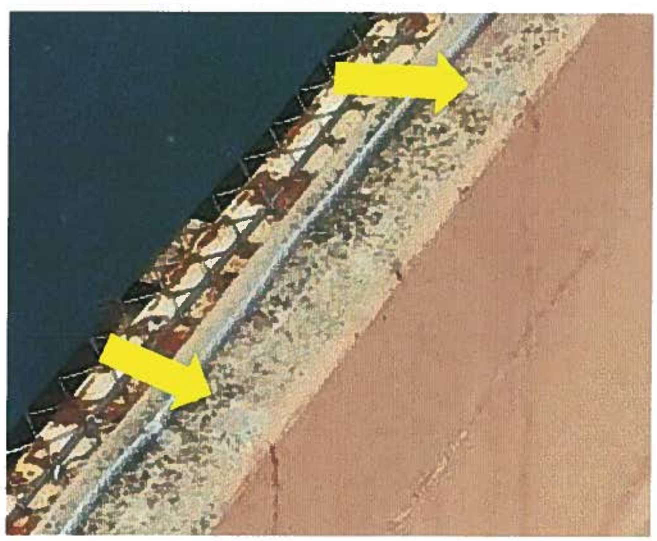

Figure 8 - Enlarged portion of Figure 7 showing cementitious strand covers (arrows)

Figure 9 - Cracks at panel corners; and breach in joint sealant (Brenner photo)

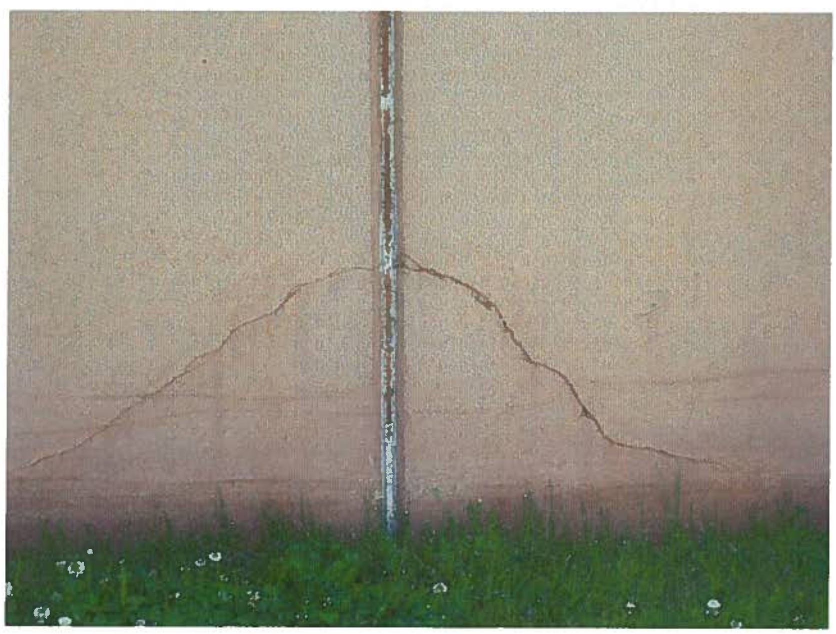

Figure 10 - Aligned cracks at panel corners (Brenner photo)

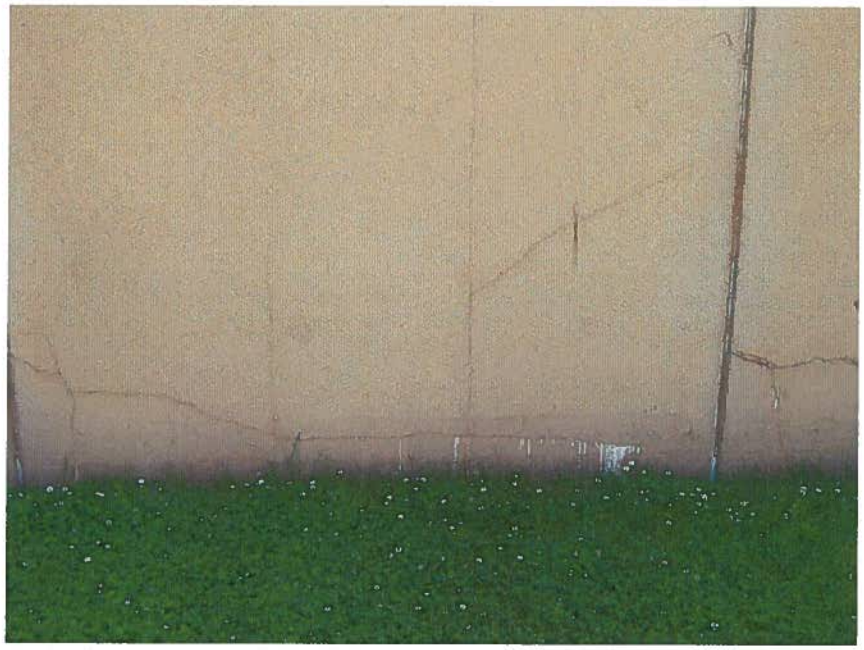

Figure 11 - Various types of cracking in a wall panel, and efflorescence (Brenner photo)

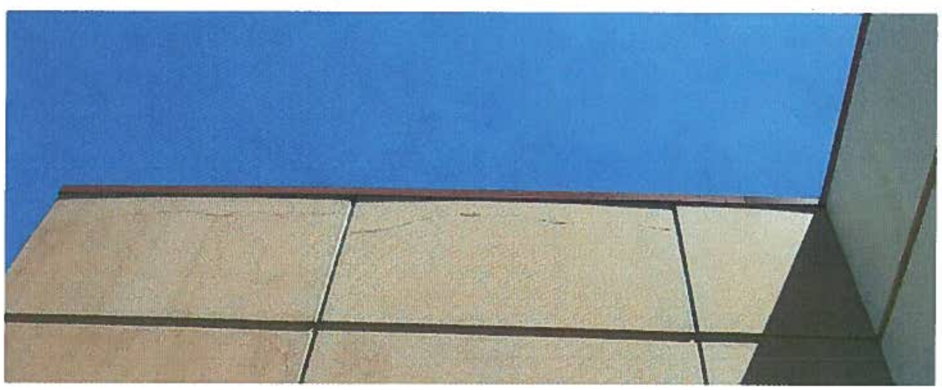

Figure 12 - Horizontal cracking at the tops of panels. Vertical stains are visible below some portions of the cracks (Brenner photo)

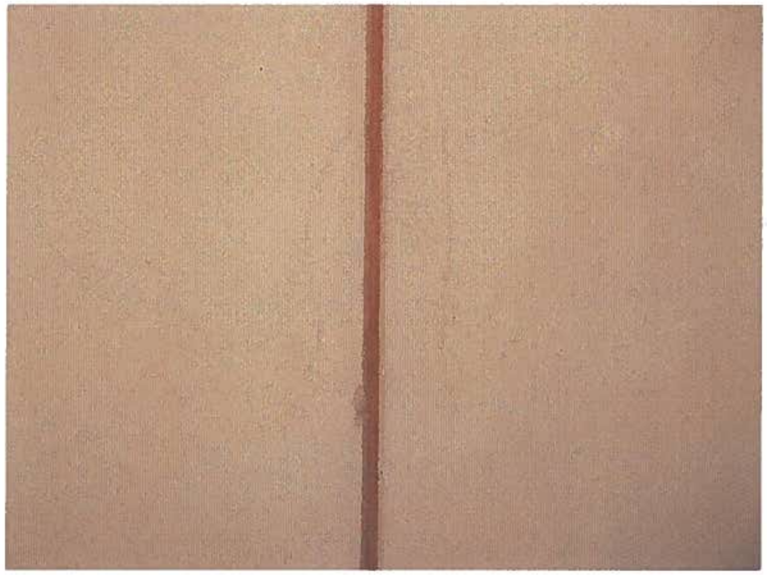

Figure 13 - Short vertical cracks on each side of vertical panel joint (Brenner photo)

CHAMPAIGN COUNTY ADMINISTRATIVE SERVICES
1776 East Washington Street, Urbana, Illinois 61802-4581
ADMINISTRATIVE, BUDGETING, PURCHASING, & HUMAN RESOURCE MANAGEMENT SERVICES
Debra Busey, County Administrator

To: Chair Alan Kurtz and Members of the Champaign County Board
From: Van A. Anderson, Deputy County Administrator of Finance
Subject: DCEO Rebate for Brookens Energy Performance Upgrade
Date: August 20, 2014
cc: Debra Busey, County Administrator and Dana Brenner, Facilities Director

Resolution No. 8984, a contract with Alpha Controls & Services LLC in the amount of $139,670 to fund a project to improve the energy efficiency of the Brookens Administrative Center's heating, cooling, and ventilation (HVAC) system, is on the consent agenda. The project is estimated to save up to 29% on electricity and 27% on natural gas costs annually providing an estimated project payback of thirty-six (36) months. To help fund the project, an Illinois Department of Commerce and Economic Opportunity (DCEO) Illinois Energy Now rebate application was completed requesting 75% of the project cost, the maximum allowable rebate. On Tuesday, August 19th, the County was advised that DCEO had approved the rebate at the 75% level for a total of $104,752.50. Due to Facilities Director Dana Brenner and Building and Grounds Supervisor Kirk Kirkland attending the recent DCEO Trade Ally Rally Central Illinois, the project rebate is eligible for an additional 15% rebate ($15,712.88) which will bring the total rebate to $120,465.38 or 86.25% of the project cost. Factoring in the rebate, the project has a simple payback of 5.7 months based on the estimated annual energy (gas and electric) savings of $40,757. This information is shown in tabular form below.

Energy Performance Upgrade		
Project Location:	Brookens Administrative Center	
Contractor:	Alpha Controls & Services, LLC	
Project Scope:	Implement ventilation improvements and DDC controls upgrades for the multi-zone units and fan coil units	
Project Cost:	$ 139,670.00	
Project Rebate from DCEO		
Electric:	$ 54,599.37	
Gas:	$ 50,153.13	
Subtotal:	$ 104,752.50	
Additional 15% rebate:	$ 15,712.88	
Total Rebate at Completion:	$ 120,465.38	
Rebate as Percentage of Project Cost:	86.25%	
Project Cost After Rebate:	$ 19,204.63	
Potential Annual Energy Savings:	$ 40,757.00	
Simple Payback in Months:	5.7	